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Examination of Suitability of Factor Endowment Theory with the reflection on Transportation Cost in International Business

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Abstract: International Business is a device which provides a support of convenience of exchanging goods or services or both between two or more countries. More prominently in a condition, one good is available abundant in one country and in the identical point of time there is a dearth and much demand from another country for the same or similar goods. During 18th and 19th century a number of international trade theories came into force with the aim of identifying course of action for smooth carrying of business by countries through export and import. **Factor Endowment Theory** is one of international trade theories focuses on effective international business with the optimum utilization of factors of production. The Factor Endowment theory was contributed by the Swedish Economists Eli Heckscher and Bertil Ohlin. It focuses on smoothening of international business in terms of exports and imports by using abundant factors of production and attaches the restraint on trade in order to get comparative advantage. One country must produce those products associated with such country's abundant factor of production and import those products which are difficult to produce or the production leads to high product cost on account of lack of associated factor of production. This argument is justified on the premise that the exporting country is capable of producing the product with relatively low cost by effectively exploiting the associated abundant factor of production. Factor Endowment Theory holds valid only within the framework of assumptions. This paper examines the relationship between availability of abundant factors of production and international business with the profound connection with the transportation cost and essentially focuses on suitability of factor endowment theory with current trend.

Keywords: Factor Endowment, Capital, Labour Cost, Logistic, Transportation Cost, International Business.

Introduction

The world is the bunch of a number of interdependent countries. They are interconnected for the mutual benefits. Each country is bestowed with different natural and human resources. In addition, each country has developed its own potentiality in certain identified areas. Hence, Creator-resources (natural resources) and created-resources serve as major factors of production of goods and services. As a result of its unique abilities, in terms of relevant factors of production, a country stands different with respect to cost of production of a product when compared to the cost of production of the same or similar product in other country. It means that a country is more efficient in producing a product by using its abundant factor of production where as in the same situation another country is very poor in producing the same or similar product as a result of lack of required factor of production.

Eli Heckscher (1919) and Bertil Ohlin (1933) laid the groundwork for substantial developments in the theory of international trade by focusing on the potentiality of production based on the composition of countries' factor endowments. The Heckscher–Ohlin Theorem states that the country which has a comparative advantage in commodities whose production is cheaper relatively on account of abundant factor, and hence, exports those commodities. Meanwhile, a country would import commodities whose production is relatively costlier on account of scarce factor of production. Thus, differences in comparative advantage are attributed to the differences in the availability of factor of production.

Factor Endowment Theory – A View

The Heckscher-Ohlin theory focuses on the relevant relationship of international business with factor of production. It considered two major and most important factors of production viz., labour and capital. Some countries are relatively well-endowed with capital but lack of labour force. In such countries, wage rates generally are high; as a result, the costs of producing labour-intensive goods—such as textiles, sporting goods, and simple consumer electronics—tend to be more expensive than in the countries with abundant labour and low wage rates. On the other hand, goods which require much capital and only a little labour (e.g., automobiles and chemicals) tend to be relatively inexpensive in the countries where abundant and cheap capital is available. Thus, countries with abundant capital should generally be able to produce capital-intensive goods relatively inexpensively and exporting them in order to pay for imports of labour-intensive goods. Factor Endowment theory states that a country exports those goods which are relatively more intensive in the factor and relatively more abundant in that country and import those goods which are relatively less intensive in the factor which relatively less abundant in that country.

Literature Review

Donald R.Davis (1995) explored with perfectly intra industry goods, factor intensities in the two sectors will always be the identical, at any factor prices, and for any factor endowments. **Donald R. Davis David E. Weinstein Scott C. Bradford Kazushige Shimpo** (1996), stated the Heckscher-Ohlin model under the conventional restrictive assumptions is a poor predictor of the international pattern of production, hence of net factor trade. However, this changes markedly when applied to predictions for regions of Japan. Given the long thread of empirical failures of Heckscher-Ohlin, it is surprisingly successful as a theory of the location of production and the

pattern of consumption – hence the net factor content of trade – off these regions. **Edward E.Leamer (1995)** stated that the HO model provides option to sell factor services externally transforms a local market for factor services into a global market. As a result, the derived demand for inputs becomes much more elastic and also more similar across countries. **James R.Markusen, Anthony J.Venables (2000),** shown that the world as a whole benefits from the presence of multinationals, and these gains accrue disproportionately to countries whose factor endowment is such that, in the absence of multinationals, they would have few national firms. There may be welfare loss for a country which, in the absence of multinationals, has a large share of the world industry.

Objectives of the Study

1. To study the importance of transportation cost in international exports and imports.
2. To study the influence of transportation cost on total cost and price per product.
3. To study the outcome of transportation cost ignorance and reflection in international trade and factor endowment theory.

Scope of the Study

This study essentially focuses on the influence of transportation cost on international business concurrently on factor endowment theory which has been contributed by Hecksher-Ohlin. And this study points out the effect of considering transportation, and for this examination it considers the relevant data of fourteen countries which are having the international trading with India. The Study mainly examines effects of ignoring‘ no transportation cost assumption‘ of Factor Endowment Theory.

Research Methodology

The required information has been collected through reputed Journals, Research Papers, Books and websites.

Limitations

a) In international exports or imports the transportation cost is computed on the basis of weight, size, value of goods but this study has taken transportation cost solitary on the basis of value of goods.
b) The same currency has been considered for comparing cost, and ignored changes in currency values between various countries.

The Basic Theorems of the Heckscher-Ohlin Model

Theorem I (Stolper-Samuelson): A (small) change in relative prices and in factor rewards increases the real reward of the factor intensive in the production of the goods whose relative price has risen and reduce the real reward of the other factor, provided that the economy remains diversified.

Theorem II (Global Stolper-Samuelson): Theorem II applies to finite price changes leaving the economy diversified, provided that endowments are held fixed or that the technology does not exhibit factor intensity reversals.

Theorem III (Factor Price Equalization): For each P consistent with both goods being produced, there exists a cone H (P) of endowments such that all countries with endowments in H (P), and with the given technology, will have identical factor prices when freely trading at world prices P. The cone H (P) is of full dimensional as long as it does not coincide with a factor-intensity reversal.

Assumptions or Conditions to application of Factor Endowment Theory

- Two factors of production (e.g., land and labor)
- Competition in all markets
- Factor supplies are fixed, and there is no factor mobility
- Each factor is fully employed in each country with or without trade
- There are no transportation or information costs
- There are no imposed tariffs or other barriers to trade
- The production functions for each good are the same in the two countries
- All production functions are linearly homogeneous
- All production functions are immune to factor intensity reversals
- Both countries produce both goods with or without trade

One of the reasons why a country might have comparative advantage in a good is that countries differ in their factor endowments. There are two factors capital and labor. The home country is the capital abundant one, the one with more capital per unit of labor. One of the goods is more capital intensive than the other: it uses more capital per unit of labor than the other good. Countries have access to same technologies - factor endowments only difference between countries.

Under free trade, the capital abundant (home) country is expected to produce relatively more of the capital intensive good than the other country. Therefore it is expected to export the capital intensive goods if no strong bias in consumption. Owners of capital in the capital abundant (home) country benefit due to seeing their rents rise relative to prices of goods, while owners of labour (domestic workers) suffer due to seeing their wage fall relative to prices of goods. As long as capital endowments in the two countries are not too different, and capital intensive good is same in both countries, the wage and rent will be same across countries under free t rade with no transport costs.

Analysis and Discussion

1. Identification of the strength of countries

The Factor Endowment Theory pre-supposes that the countries with the abundant factors have an edge over the other countries in the production of goods and effecting exports. An attempt has been made to identify the strength of countries in terms of factors and to analyse their impact on production and exports.

Table 1: Country-wise GDP per capita, Total Population, Area and Area per person

Sl. No.	Country	GDP per capita(USD)	Population	Area (square km)	Area per person (square km)
1	Qatar	1,02,211	1,963,124	11,586	0.0059
2	Luxembourg	79,785	537,000	2,586	0.0048
3	Singapore	60,410	5,312,400	699	0.0001
4	Norway	55,009	5,063,709	323,802	0.0639
5	United States	49,012	316,163,000	9,629,091	0.0304
6	Canada	42,734	35,141,542	9,984,670	0.2841
7	Australia	42,642	23,072,354	7,692,024	0.3333
8	Japan	36,395	127,320,000	377,915	0.0030
9	France	35,548	65,657,000	551,500	0.0084
10	India	3900	1,210,569,573	3,287,263	0.0027
11	Pakistan	2,900	183,556,000	796,095	0.0043
12	Bangladesh	2,000	152,518,015	143,998	00009
13	Russia	17,709	143,400,000	17,098,242	0.1192
14	Mexico	15,312	117,409,830	1,964,375	0.0167

Source: IMF (GDP per capita) Report 2012

The above table reveals that the strength of countries in different factors [i.e., capital, population (labour), and land]. On the basis of data presented in the above table, the following observations are made:

a) Qatar, Luxembourg, Norway, Mexico and Japan have the strength of capital and labour but feeble in availability of land.
b) The countries such as India, Pakistan, and Bangladesh have good strength in the population which results in easy availability of labour, but feeble in availability of capital and land.
c) A few countries, such as Australia, Canada and Russia, posses‘ capital and land but suffer from inadequacy of labour as a result of less population.
d) The United States of America possesses abundant capital, adequate land and manageable man power. Thus, USA exports all class of goods to other countries.

The main reasons for this kind of fluctuations are imbalance in distribution of natural resources, distinct birth rates, and asymmetrical economic conditions among various countries of the world. This disproportion provides an opportunity to use comparative advantage with mutual agreement between countries through exchange of goods or services.

2. Transportation Cost in International Business and Its Influence on Factor Endowment Theory

Transportation cost has significant impact on the structure of economic activities as well as on international trade. Transportation cost refers to the expenses incurred in moving products or assets from one place to other place, which is often passed on to consumers. In international business, the products are transferred to consumers residing in other country. This process requires huge transportation cost because, in cross-border trade, the distance of transferring goods is incredibly high compared to domestic trade. Hence, high transportation cost pushes up the price of the product.

An exercise has been made to ascertain the transportation cost (percentage of value) by considering the sea-distance from India to the countries selected for the present study. 10,000 kg of products of value of $ 1,00,000 are taken as sample for estimation of transportation cost. It is ensured that the transportation cost to include the provision for the cost of refrigeration and insurance.

Table 2: Transportation Cost of goods from India (Cochin port) to other Countries

Sl. No.	Country	Destination Terminal	Sea Distance (in km)	Freight (LCL = Gross weight 10,000 k.g. Value $ 1,00,000, Refrigerated, with Insurance) (USD)	% of Transportation Cost on Value of goods
1	Qatar	Doha	3361.1	3940.27 – 4355.03	3.94 - 4.36
2	Luxembourg	No Sea Route			
3	Singapore	Singapore	3439.1	4155.70 – 4593.14	4.16 - 4.59
4	Norway	Alvik	13029.5	5638.57 – 6232.10	5.64 - 6.23
5	United States	Charleston	16275.4	9127.00 -10088.41	9.13 - 10.09
6	Canada	Victoria	16383.2	10173.51 – 11,244.00	10.17 - 11.24
7	Australia	Melbourne	9278.6	5467.22 – 6042.82	5.47 - 6.04
8	Japan	Yakohama	8800.8	6107.98 – 6750.92	6.11 - 6.75
9	France	Rauen	8588.4	5690.22 – 6289.19	5.69 - 6.29
11	Pakistan	Karachi	1936.0	2447.49 – 2705.12	2.45 - 2.71
12	Bangladesh	Chittagong	2533.0	6083.73 – 6724.12	6.09 - 6.72
13	Russia	Tuapse	8405.0	4548.65 – 5077.45	4.55 - 5.08
14	Mexico	Attamira	18619.9	10898.14 – 12045.32	10.90 - 12.05

Source: **www.worldsearates.com**

Note: LCL – Less Container Load, **USD** – US Dollars

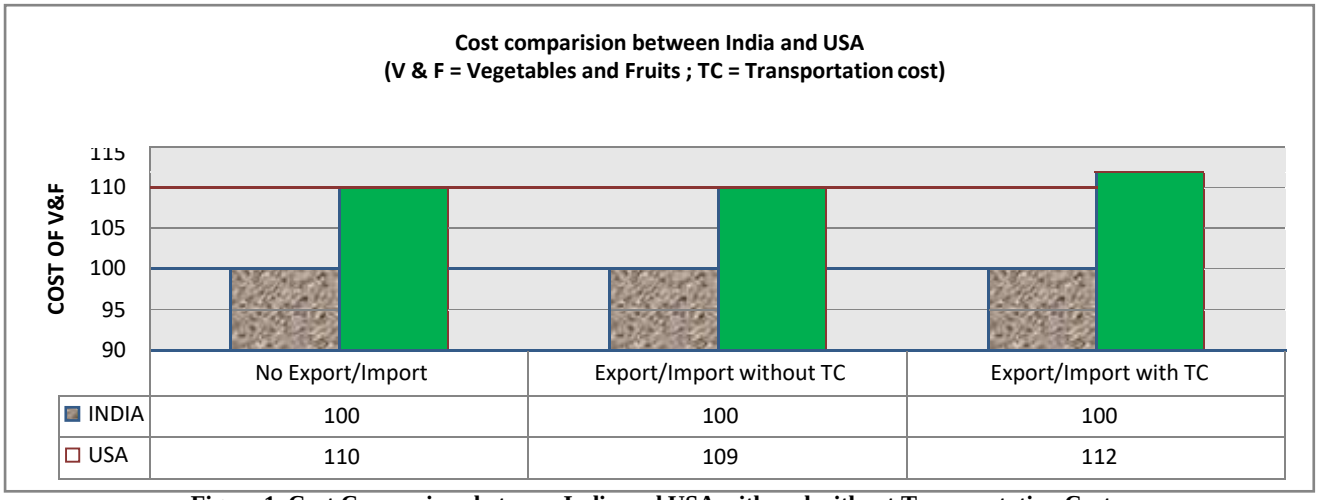

Figure 1: **Cost Comparison between India and USA with and without Transportation Cost**

The data in Table 2 reveals that the transportation cost from India to other countries is inconsistent as it depends on the distance. It is known fact as the distance increases that the transportation cost increases. It is evident from the data that the transportation cost would be 10 to 12 percent of the total value of product where Indian trader exporting commodity to USA, Mexico and some other countries extremely far from India. It is also known that the price of the product goes up with the increase in the cost. Therefore transportation cost would be added to original domestic cost while calculating product cost in importing country. Hence, the product which is Rs.100 in domestic country (India) might be equal to Rs.112 in importing countries (USA, Mexico). Consequently transportation cost influences on export and import. It is worth to be noted that the factor endowment theory assumes no transportation cost provides provision for fulfilling expectations of customer residing in different countries with the exchange of products which are associated with abundant factors of production. In the above example (refer to Figure 1), India is exporting vegetables and fruits, which are associated with one of India's abundant factors of production (i.e., is labour), to the USA for Rs.109. A trader can sell the product (i.e. vegetables and fruits) at Rs.100 in India or he can export to US at Rs.109. It provides a comparative advantage for both the countries explicitly India and USA. The Factor Endowment Theory is applicable only in those situations where the product is produced by one country with relatively lower cost with the usage of abundant factor of production compared to other countries where cost of the product relatively is high as a result of scarcity in specific factor of production required to produce such product.

The above statement makes it very clear that the factor endowment theory is applicable only in those situations when transportation cost is ignored. But with the consideration of transport cost, it becomes meaningless even though one country is producing product with less cost with the usage of abundant factors of production. For instance, cost of 1 kg of vegetables and fruits in India is Rs.100; at the same time 1 kg of vegetables and fruits in USA is Rs.110. By comparing the cost of product in both the countries and with the application of Factor Endowment Theory, it is susceptible that USA needs to import vegetables and fruits in order to get comparative advantage. But when the transportation cost is considered the suggestion becomes meaningless. Because, transportation cost will be 10 to 12 percent on a product and it makes the cost of the product in USA to be Rs.112, which is more than domestic (USA) cost (Rs.110).

Outcome of the Factor Endowment Theory with the Contemplation of Transportation cost

1. Consideration of transportation cost tends to increase in the cost of product and it results in price hike.
2. The cost of the same product even with the consideration of transportation cost varies from country to country on account of variation in distance. Hence, the cost of export increases as distance increases.
3. Cost of logistic becomes very costly when distance is immense. In such a situation, the cost of imported goods becomes costlier than the cost of domestically produced products. Thus, when the transportation cost is considered in international trade, the comparative advantage on account of abundant factors will be nullified or even negated.

Findings

1. Countries' abundant factor of production advantage becomes ineffective in international exchange of commodity when there is an existence of transportation cost.
2. Ignorance of transportation cost in international business leads to taking erroneous decision.
3. Customers of one country miss out from getting benefit of product allied with abundant factors of production of other country owing to transportation cost.
4. In several situations, cost of product in domestic country is cheaper than imported product due to high transportation cost.
5. In modern era, the maximum portion of cost of goods comprise of transportation cost. Therefore, ignorance of transportation cost leads to take false decision.

Conclusion

In international business, transportation cost is one of the major constituents in the product cost. The ignorance of transportation cost does not exhibit appropriate picture of unit cost, and creates perplexity while taking decision in the firm. Transportation cost differs

from country to country as the distance between exporting and importing countries differs, and increase in distance adds additional cost to the product. Countries' abundant factor of production advantage may not be supportable if, there is a consideration of transportation in international business. So the factor endowment theory works only with the assumption of no transportation cost as mentioned in Factor Endowment Theory. But in modern days transportation cost is one of the major part of cost of production, thus ignorance of transportation cost not gives satisfactory awareness in exporting or importing of goods. Transportation cost is a pivotal cost component in modern international business and in utmost situation the ignorance of transportation cost could negate comparative cost advantage. Therefore, in most of the circumstances, the applicability of Factor Endowment Theory with the ignorance of transportation cost is not appropriate in modern era.

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